

Independent Evaluation Of Three DOE Analysis Model Reports:

INTRODUCTION



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May 5, 2004

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NRC's Role At Yucca Mountain

- Independent regulator
- Primary mission is to protect public health and safety
- Must decide whether to authorize DOE to construct the proposed repository
- If authorization is granted, must assure DOE complies with the rules

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NRC Will Do So By...

- Reviewing all information objectively
- Making open decisions based on the facts

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NRC Must Decide Whether To Allow DOE To Construct A Repository At Yucca Mountain

- If DOE submits a license application, Congress directs NRC to decide within three years

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To Do Our Job, NRC Needs To Interact With DOE About Yucca Mountain

- To stay informed about DOE's activities in preparation for submission of a license application
- To focus on what is necessary for a complete and high-quality application

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What Does NRC Consider A "High-Quality" Application ?

- Contains data and information that
 - Support technical positions advanced
 - Are traceable and transparent
 - Are technically appropriate for their use
- Provides understandable technical explanations
- Includes information necessary to justify those explanations

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NRC Is Concerned About Quality Assurance At Yucca Mountain

- DOE has a history of recurring problems with quality assurance implementation
- These problems, affecting models, software, and data, could impact NRC's ability to effectively complete its safety review of a potential license application

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Independent NRC Evaluation

- Summer 2003—NRC states intent to conduct independent evaluation
- Fall and Winter 2003 — NRC conducts three targeted quality assurance audits of specified DOE technical documents

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Independent NRC Evaluation (cont.)

- April 2004 -- NRC issues report
- May 2004 – Public technical exchange
- June 2004— Written response due

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NRC Evaluated DOE's Data, Models and Software For

- Transparency
- Traceability
- Appropriate application for intended use

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NRC's Evaluation

- Found Some Good Practices
- Noted Improvements
- Identified Concerns

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Independent Evaluation of Three DOE Analysis Model Reports:

OVERVIEW



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Purpose of Quality Assurance Program

- Implement planned, systematic actions
- Provide confidence that repository and its structures, systems, and components will perform satisfactorily

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NRC's Oversight of DOE's Yucca Mountain QA Program

- Evaluation during "Pre-application" phase by Observing DOE audits
- DOE found recurring problems with its ability to implement some aspects of its QA program
- NRC was concerned with potential impact of these implementation problems

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NRC's Independent Evaluation

- Audited three work products called Analysis Model Reports (AMRs)
- Each audit involved a week of preparation followed by a week of on-site review
- Teams of independent technical NRC staff and staff from the Center for Nuclear Waste Regulatory Analyses

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NRC's Independent Evaluation

- Examined
 - Quality of technical information
 - DOE's development and control processes
 - Effectiveness of DOE corrective actions
- Findings and conclusions Issued in a public report on April 13, 2004
- Does not duplicate or replace safety review of a potential license application

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Future NRC Activities

- NRC will take necessary action to fulfill our safety and health mission
- Implement an Inspection Program at the appropriate time if an application for a high-level waste repository is received and accepted for review

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Independent Evaluation Of Three DOE Analysis Model Reports:



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Outline

- Background
- Purpose
- Scope
- Evaluation Performance
- Good Practices
- Concerns
- Conclusions

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Background

- License Application in December 2004
- Lack of effective corrective actions
- NRC staff expressed concerns
- Potential impact on NRC staff review
- Stated intent to evaluate independently DOE's performance

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Purpose

- Evaluate independently DOE's performance in developing Technical Reports

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Scope

- NRC staff evaluated
 - Technical information
 - Controlling processes
 - Corrective actions

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What were the auditors looking for?

- Are technical bases and information of high quality?
 - Traceable?
 - Transparent?
 - Appropriate for its use?
- NRC's Yucca Mountain Review Plan

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Selection Of Technical Reports

- Three targeted audits
- NRC staff used "Baseline of Risk Insights" to select three Technical Reports

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Technical Reports Audited

- "General and Localized Corrosion of the Waste Package Outer Barrier"
- "Commercial Spent Nuclear Fuel Waste Form Degradation Model"
- "Drift Degradation Analysis"

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Scope - Controlling Processes and Corrective Action

- Effectiveness of processes
- Corrective action effectiveness

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Evaluation Performance

- Research
- In-Briefings
- Technical Interviews
- Information Research
- Daily Briefings
- Out-Briefing
- Technical Exchange

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Good Practices

- Excellent cooperation and support
- Technical support for topics audited has improved
- Current reports are more comprehensive and contain more data
- Data qualification program effective in identifying some data concerns

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Concerns - Technical Information

- Technical basis not explained clearly (Sufficient technical information may have been available)
- Technical basis explained clearly but technical information not sufficient

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Concerns - Control Processes

- Document review
- Lack of self-identification

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Concerns - Corrective Actions

- Confirmed lack of effectiveness
- Human performance key contributor
- Human Performance Improvement

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Conclusions

- Number and pattern of concerns suggest other reports may have similar limitations
- License Application may not contain information sufficient to support some technical positions
- Could result in many NRC requests for additional information in some areas
- This would extend NRC's safety review and could prevent NRC from making a decision within the time required by law

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